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because I failed to find an adequate account in such standard elementary text-books as came to my hands. Thus the explanation given in Daniell's physics is empiric and about within the limits of Perry's little book on tops. Ganot and Deschanel, Barker and Carhart, avoid the matter altogether. Kelvin and Tait's 'elementary' treatise has a single paragraph, intelligible at once, no doubt, to the authors. Peddie puts a slight expansion of this paragraph into his book. Even Violle's large new work says nothing about tops. In the German books, like Müller-Pouillet, Wüllner and the excellent treatise of Mousson, the phenomena are interpreted by aid of a suggestion of Poggendorff's, the very object of which is to dodge the principles of rotation involved under cover of a reference ('nur durch höhere Rechnung') to Euler. Yet gyrostats of diverse forms usually abound in physical cabinets. Supposing an instructor is not on the outlook for special entertainment for his children, of what use is such apparatus, I ask, if it be not to furnish the most striking tests imaginable of the truth of the above fundamental doctrines of rotation.

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ZOOLOGICAL NOTES.

NANSEN'S DISCOVERY OF THE BREEDING GROUNDS OF THE ROSY GULL.

OF the result of Nansen's Expedition thus far announced one of the most interesting, at least to ornithologists, is the reported discovery of the breeding grounds of Ross' Gull, also known as the Wedge-tailed or Rosy Gull (*Rhodostethia rosea*). In a letter published in the *London Daily Chronicle* last November, Dr. Nansen stated that he found flocks of Rosy Gulls on August 6th, in latitude $81^{\circ} 38'$, east longitude 63° . The birds were seen near four small islands called

'Hirtenland' by Nansen, a little northeast of Franz Josef Land. While Nansen did not actually find nests, he found the birds abundant, and concluded that their nests were probably near by. Every item of information regarding this rare bird is of interest, and in the December number of the *Ornithologische Monatsberichte* (pp. 193-196), Dr. Herman Schalow calls attention to the importance of Nansen's announcement and takes occasion to review briefly the history of the species.

There seems to be no reason to question the correctness of Nansen's determination of the birds or his surmise that they were breeding not far away. The wedge-shaped tail and the rosy tinge of the plumage (both noted by Nansen) are unmistakable characters of the species, and the presence of the gulls in such numbers in that high latitude renders it very probable that they were breeding. The Rosy Gull has long remained one of the rarest gulls. It was described from a specimen collected by Sir James Clark Ross in 1823, on Melville Peninsula, but in the next half century only a few individuals were taken and these in widely separated localities. In the autumn of 1881 Murdoch observed large numbers at Point Barrow, Alaska, apparently migrating from the west to the northeast. Although he secured a good series of specimens, he could add little to the life history of the species, and no other naturalist in Alaska has had the good fortune to meet with it in such numbers. This gull has also been taken in North America at St. Michael's, Alaska, and Disco Bay, Greenland, but it was not seen by the Lady Franklin Bay expedition. It was met with off the Siberian coast by the Jeannette Expedition, and was recorded by Payer between Nova Zembla and Franz Josef Land, only a few degrees to the south of the islands where Nansen found it.

The Rosy Gull is a typical arctic circum-

polar bird, reaching a latitude attained by few other species, and specimens taken outside the Arctic circle (at St. Michael's, Kamchatka, the Færöe Islands, Heligoland, and Yorkshire, England) can only be regarded as stragglers. No one has yet been able to explain what becomes of the thousands which pass Point Barrow in the autumn, and less is known of the winter home of this gull than of the region where it breeds. Murdoch supposed that its breeding grounds were somewhere north of Wrangel Island. Nansen's observations seem to indicate that they are much farther to the west, but, as Schalow remarks, "when will man's foot again tread the dreary wastes of those high latitudes where one of the greatest rarities of northern oology is to be found?"

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ORIGIN OF PARASITISM IN THE COWBIRD.

REPRODUCTIVE parasitism, as we find it in our Cowbirds, is such a rare exception to the rule among higher animals, where parental affection is highly developed, that it never ceases to be an object of speculation as to its origin.

There are two peculiarities for which our Cowbird is renowned: The one which gives him his scientific name, *Molothrus*, a parasite; the other, which causes him to be called Cowbird, his strong attachment to grazing animals, especially horses and cattle.

Now, should there not be a connection between these two traits? Nobody would think that the habit of following horses and cattle has been formed since the introduction of these animals by the white man. Its Indian name, 'Buffalo-bird,' was certainly no misnomer, and it can hardly be questioned that for ages the buffalo, or American bison, was the animal which, in the economy of our cowbird, played the part now taken by the domestic animals.

The distribution of the one coincides in the main with that of the other, except that in recent years the Cowbird has extended its range to follow domesticated cattle. A few years ago the bison roamed over the greater part of eastern North America from the Atlantic to the Rocky Mountains, in suitable places, and it was not until the last century that it became exterminated in the territory east of the Mississippi river.

But the habits of the Cowbird were probably formed before the bison and the Red Man were on the scene, since some species in southern South America have similar traits.

The Cowbirds, like all other Icteridæ, have their origin in South America, and of the twelve species and subspecies known only three enter the United States. Not all the species are parasitic; of some we do not know the mode of reproduction, but *Molothrus badius*, of Argentina, Paraguay and Bolivia, builds its nest and rears its young like other birds, and there was undoubtedly a time when *Molothrus ater* did the same.

We know that fossil remains of horses, not much unlike ours, are found abundantly in the deposits of the most recent geological age in many parts of America from Alaska to Patagonia. It was probably at that period that the Cowbirds acquired the habit of accompanying the grazing herds, which were wandering continually in search of good pasture, water and shelter, and in their seasonal migrations and movements to escape their enemies.

As the pastoral habit of the bird became stronger, it gave rise to the parasitic habit, simply because, in following the roving animals, the birds often strayed from home too far to reach their nests in time for the deposition of the egg, and, being hard pressed, had to look about for another bird's nest wherein to lay the egg.

After the acquisition of the roving habit,

it is not difficult to imagine that such cases occurred quite often, especially when, with the change of the climate, both birds and mammals spread more and more into the temperate regions where the spring movements of the grazing animals fell together with the bird's breeding time.

By a combination of favorable circumstances this new way of reproduction proved successful, and the parasitic offspring became more and more numerous. In the course of time the art of building nests was lost, the desire to incubate entirely gone, paternal and conjugal affection deadened, and parasitism had become a fixed habit.

O. WIDMANN.

CURRENT NOTES ON PHYSIOGRAPHY.

THE BRANCH STREAMS OF THE SCHUYLKILL.

Miss F. BASCOM recently discussed 'the relation of the streams in the neighborhood of Philadelphia to the Bryn Mawr gravel' (*American Geologist*, XIX., 1897, 50-57), with the object of determining the disputed age of the gravels from the amount of work done by the branches of the Schuylkill since the gravels were laid down. Wissahickon, Valley and Gulf creeks are explained as of superposed origin, because they flow at certain points transversely through narrow gorges in resistant strata. This conclusion tacitly postulates the occurrence of only longitudinal (subsequent) branch streams in the Schuylkill district before the gravels were spread over the region; it remains to be proved whether so perfect an adjustment of branch streams to structures is necessary. It is entirely conceivable that, before the gravels were deposited, the Cretaceous peneplain had some transverse streams, although most of its drainage may have well become longitudinal. Whether the Wissahickon could have maintained a transverse course so near the Schuylkill through both the Cretaceous and

Tertiary cycles of denudation is certainly doubtful, but it has not been proved impossible. Gulf creek and its neighbors are so distinctly rectangular in pattern that adjustment and re-adjustment suffice to explain them without superposition. The elements of doubt and certainty are here so blended as to illustrate the dangers as well as the values of river analysis as a means of deciphering geological history.

HANN'S ALLGEMEINE ERDKUNDE.

THE Allgemeine Erdkunde of Hann, Hochsetter and Pokorny now reaches its fifth edition. The first part, treating the earth as a whole, the atmosphere and the hydrosphere being still prepared by Dr. Julius Hann (Vienna, Tempsky, 1896, 336 p., 24 colored plates and 92 figures), while volumes on the earth's crust and its forms by Brückner, and on the distribution of plants and animals by Kirchhoff, are promised for 1897. Hann's revised volume impresses one as a thorough work by a competent author, useful as a text for an advanced collegiate course, or as a reference book for advanced students. It is questionable whether various elementary facts, such as the obliquity of the ecliptic, the variation of the length of the day and its cause, and the weather-map facts as to cyclonic circulation, deserve a place in such a work; for any one who is competent to use the rest of the book should have been for some years familiar with these fundamentals. The more serious subjects may be inferred from a rapid review of the contents; the size and shape of the earth, and their consequences in the variation of gravity and the determination of positions; terrestrial magnetism and auroras; the atmosphere, its temperature, pressure, winds, moisture, rain and weather—with less attention to the origin of cyclones than would be welcome; the ocean, its depth, composition, temperature—this treated in much detail—